

SEQUENCE LISTING

<110> XIANG, JINHUA
WÜNSCHMANN, SABINA
SCHMIDT, WARREN
STAPLETON, JACK T.

<120> FULL-LENGTH GB VIRUS C (HEPATITIS G VIRUS) RNA TRANSCRIPTS ARE INFECTIOUS IN PRIMARY CD4 POSITIVE T CELLS

<130> IOWA:030US

<140> UNKNOWN
<141> 2001-04-05

<140> 60/253,390
<141> 2000-11-27

<150> 60/195,597
<151> 2000-04-06

<160> 2

<170> PatentIn Ver. 2.1

<210> 1
<211> 9395
<212> DNA
<213> Hepatitis G virus

<400> 1

tgacgtgggg gggttgatcc cccccccccc gcactgggtg caagcccat aaaccgacgc 60
ctatctaagt agacgcattg actcgccgccc gactcggcga ccggccaaaa ggtgggtggat 120
gggtgggtac agggttggta ggtcgtaaat cccggtcatc ctggtagcca ctatagggtgg 180
gtcttaagag aaggtcaaga ctccctttgt gcctgcggcg agaccgcgca cggtccacag 240
gtgctggccc taccgggtgtg aataaggggcc cgacgtcagg ctgcgtcgta aaccgagccc 300
gtcacccacc tggcaaacg acgcccacgt acggtccacg tcgccttca atgtctct 360
tgaccaatag gtttatccgg cgagttgaca aggaccagtg gggccgggg gttatgggaa 420
aggacccaa accctgcctc tcccggtggg ccgggaaatg catggggcca cccagctccg 480
cgccggcctg cagccggggt agcccaagaa tccttcgggt gagggccgggt ggcatttctc 540
ttttctatac catcatggca gtccttctgc tccttcgt gggtgaggcc gggccattc 600
tggcccccgc cacccacgct tgtcgagcga atggcaata ttccctcaca aattgctgtg 660
ccccggaaga catcggttgc tgcctgaaag gccgtgcctt ggtggccctg ggtgcacgg 720
tttgcaccga ccgttgcgtgg ccactgtatc aggcgggttt ggctgtcggt cctggcaagt 780
ccgcggccca gctcggtggg gaactggggc gctgtacgg gcccttgcgt gtctcggtt 840
acgtagccgg gatccctgggt ctggcgagg ttactccgg ggtccctgaca gttgggttg 900
cggtgaggcg ccgggtctac ctgatgccca acctgaagtg tgcaagttagaa tggacgtt 960
agtggggaaag ttagtttgg agatggactg agcagttggc ctccaattac tggatttgg 1020
aataaccttgc gaaagtccca tttgaattt ggagaggagt gatgagccctg acccctctgt 1080
tggttttgggt gggccatttgc ttttgcgtgg agcaacggat tgtcatgggtt ttcctgcgt 1140
tgacgtggc gggatgttg caaggccccc ccgcctccgt tttgggtcc cggccctttg 1200
actacgggtt gaagtggcag tcatgccttgc gcaaggctaa cgggtcgcgt atccccactg 1260
gggagagggt gtgggatcga gggaatgtca cgcttgcgt tgactgcccc aacggccct 1320
gggtttgggt ccggcccttgc tggcaggcggttggg cggccatc accattggaa 1380
gccacggaca aaaccagtgg cccctatcat gcccccaata tgtctatggg tctgtgtccg 1440
taacgtgcgt gtggggttcc gtgtcttgcgttgcac cggcggtcgt gattcgaaga 1500
tcgatgtgtg gagtttggat ccgggttggat ctggcagctg caccatagcc gctctagggt 1560

catcgatcg cgacacgggtg gttgagctct ccgagtgggg agtccgtgc gtaacgtgta 1620
ttctggaccg tcggcctgct tcatgtggca cctgtgtcg ggactgctgg cccgaaaccg 1680
ggtcggtag attcccttc catcggtcg gcacggggcc tcggctgaca aaggacttgg 1740
aagctgtgcc ctctgtcaac aggacaactc ccttcacccat aaggggcccc ctgggcaacc 1800
aggggagagg caacccggtg cggtcgcccc tgggttttg gtcctacacc atgaccaaga 1860
tccgggattc cctgcatttg gtgaaatgtc ccacaccagc catagagcct ccgactggaa 1920
cggtcgggtt ctccccggga gtcccggcca ttaacaactg catgccccta ggcacggaa 1980
tgtctgaggc attggggcggta gctgggtta cgggggggtt ctacgagcct ctggttcgca 2040
ggtgttcggta gctgatggga cgccgaatac cggttgcgg ggggtacgca tggctgtcct 2100
ctggtagacc tgacgggtt atacacgtcc agggggcacct gcaggagggt gatgcgggca 2160
acttcatccc tcctccacgc tgggtgtct tggatttgt atttgcctg ctctatctga 2220
tgaagctggc tgaggcacgg ttggtcccg tcatcttgct tctgctgtgg tgggtgggtga 2280
accagttggc ggttcttagga ctgcccgtg tgacgctgc cgtgggggt gaagttttt 2340
cggggccctgc ctgtcatgg tgggtggcc ttcccaactgt cagtatgata cttaggtctag 2400
caaacctggt gtttacttt cggtggatgg gcctcagcg cctcatgttc ctctgtttgt 2460
ggaagctcgc tcggggagct ttcccgctgg cacttttgc ggggatttcg gcgaccccg 2520
ggcgcaccc tggctcgccc gccgaggctt gttcgatgt cacattcgag gtggacactt 2580
cggtgttggg ctgggtgggt gccagcgtgg tggcttggcc catagcgctc ctgagctcaa 2640
tgagcgcagg ggggtggaaag cacaaggccg tcatctatag gacgtgggt aaagggtacc 2700
aggctgtgcg ccagagggtg gtgcggagcc ccttcgggg ggggcgtcct accaagcttc 2760
tgacgttccgc ctgtgtcttgc ctgtcataca tctggccggta tgctgtgatg atgggtgggt 2820
tggcttgggt ctcctcttc ggcctgttcg acgcacttggc ctggggccctg gaggagctcc 2880
tggtctcccg gccctcgta cggcgacttgg cacgggtggg ttagtgcgtgt gtgatggcgg 2940
gcgagaaggc caccaccat cgaactgtctt ccaagatgtg cgcaagaggg gcttacctgt 3000
ttgaccacat gggcttttc tcgcgcgtg tcaaggagcg cttgttggaa tgggacgcgg 3060
cttggagcc ctgtcatcc actaggacgg actgtcgcat catcagagat gccgcgagga 3120
ccctgtcttgc cgacagtgc gtcatgggtt taccctgttgc agcacggcgc ggtgatgggg 3180
ttctcatcg tgcgttttcgatgtgatc atttgcctcc cgggtttgtc cggactgcac 3240
cagttgtcat cgcgtgggtc gaaaaaggctt ccttgggggtt cacgaaggca gccttgacag 3300
gttagggatcc tgacttacat ccaggaaacg tcatgtgtt ggggacggct acgtcacgaa 3360
gcatgggcac atgtctgaat ggcctgtgt tcaacaacttt ccatggggct tcatcccga 3420
ccatcgccac gcccgtgggg gcccattaaatc ccagggtggg gtcagccagt gatgacgtca 3480
cggtgtaccc gcttccagat gggcaactt cgttgcgcct ctgcacttgc caggcggagt 3540
cctgttgggtt tattagatcc gacggggctt tggccatgg cttagagcaag ggggacaagg 3600
ttgagctggta tggccatgt gagggtcttgc acttccgtgg ttcgtctgtt tcaccgggtc 3660
tttgcgacaa agggcacgca gtaagaatgc tcgtgtcagt gctccactt ggcggcaggg 3720
ttactgcggc gcgatttactt aggccgtggat ctaaagtacc aacagatgcc aagactacca 3780
cagaacccccc tccggtgccg gcaaaaaggag tttcaagga ggcggcgtt gttatgccta 3840
cggggggccggg aaagagcacc cgcgtaccgt tggagtacgg caacatggc cacaaggctt 3900
ttagtcttgc tccgtcggtt gctaccgtt gggccatggg cccatacatg gagcggctgg 3960
cggggaaaca ccccaagtatt tactgtggcc atgacaccac tgctttcaca agatcactg 4020
actcgccccct tacgtattcc acttacggaa gtttttggc caacccttagg cagatgctga 4080
gggggtgttc ggtgttgcatt tggacgagt gccacagtca tgactcaact gtgttgggt 4140
gcattggcgc tgcgtggggat ctggcgcggag gatgtggagt gcaattgggt ctctacgccta 4200
ctggccacccccc tccggatcc cccatggatcc agcaccaccatc aatcatttag gaaaaactgg 4260
acgtgggaga gatcccccttcc tatgggcatttgc gatatacttct tgagcggatg cggaccggaa 4320
ggcatctctgtt attctgcaccc tccaaaggctt agtgcgcggc cctggccggc cagttttcg 4380
ctaggggggtt aaatgcacat gccttattaca gggggaaaga cagttctatc atcaaagatg 4440
gagacctgggtt ggtgtgtgtt acagacgcac tattccactgg tgacactggg aacttcgatt 4500
ctgtcaccga ttgtgggttgc tgggtggggg aggtcgatgc ggtgaccctt gatcccacca 4560
ttaccatctc cctgcgcacg gtggcccgctt cggctgaact gtcgtgcag cggcggaggac 4620
gcacgggttag gggcagggtctt gggcgctact actacgcggg ggtcgaccaag gcccctgtc 4680
gtgtgggtcg ctcaggcttgc tgggtgggttgc cgggtggaaagc cgggtgtgacc tggtagggaa 4740
tggaaacctga cctgacagca aacactactga gactttacga caactgcct tacaccgcag 4800
ccgtcgccacg tgcatttggg gaagccgcgg tggcttttc ggggcttgc ccttgcgggaa 4860
tgcattcccgat tggtagctgg gaaaaggatc gcggcgtcaatggcccttc ctgggtgggtg 4920
ttcagcggacatgtgcggc gaaacactgtt ctccggccca atcggatgac cccagtg 4980

agccttcgta tcatgcata ctggacacgg cccccttctg ctccacttgg ctagctgagt 8460
 gcaatgcaga tggaaaacgc catttcttcc tgaccacgga ctttcggagg cccctcgctc 8520
 gcatgtcgag cgagtacagt gacccaatgg cttcgccat cggttacatc ctcctatacc 8580
 cttggcatcc tatacacacgg tgggtcatca tccctcacgt gtcacactgc gcgtttaggg 8640
 gtggtggcac accgtctgat cctgttggt gccaggtaca tggtaattac tacaagtttc 8700
 cactggacaa actgcctaac atcatcgta ccctccacgg accagcagcg ttgagggtta 8760
 ccgcagacac aactaagaca aaaatggagg ctggcaaggt gctgagcgc acgtatcc 8820
 ctggccttagc agtccaccgg aagaagccg gggcattgcg aacgcgtatc ctccggtcgc 8880
 gcggttggc ttagttggct agggggctgt tggcgttcc aggctgcgg ctccccctc 8940
 cggagattgc tggatcccc ggggtttcc cccttcccc cccctatatg ggggtggttc 9000
 atcaatttga tttcacaagc cagaggagtc gtcggcggtg gttgggttc ttagccctgc 9060
 tcatacgtagc cctcttcggg tgaactaaat tcatactgtt cggcaaggc cggtaactga 9120
 tcatactgg aggaggttcc cgccctcccc gccccagggg tctccccgt ggtaaaaag 9180
 ggcccggcct tgggaggcat ggtggtaact aacccctgg cagggtaaaa gcctgatgg 9240
 gctaatgcac tgccacttcg gtggcgggtc gctaccttat acgtaatcc gtgactacgg 9300
 gctgctcgca gagccctccc cggatgggc acagtgcact gtgatctgaa ggggtgcacc 9360
 ccgtaagag ctggcccaa aggccgggtt ctact 9395

<210> 2

<211> 2910

<212> PRT

<213> Hepatitis G virus

<400> 2

Met	Ser	Leu	Leu	Thr	Asn	Arg	Phe	Ile	Arg	Arg	Val	Asp	Lys	Asp	Gln
1								5			10			15	

Trp	Gly	Pro	Gly	Val	Met	Gly	Lys	Asp	Pro	Lys	Pro	Cys	Pro	Ser	Arg
					20				25				30		

Trp	Ala	Gly	Lys	Cys	Met	Gly	Pro	Pro	Ser	Ser	Ala	Ala	Ala	Cys	Ser
					35				40				45		

Arg	Gly	Ser	Pro	Arg	Ile	Leu	Arg	Val	Arg	Ala	Gly	Gly	Ile	Ser	Leu
					50				55			60			

Phe	Tyr	Thr	Ile	Met	Ala	Val	Leu	Leu	Leu	Leu	Val	Val	Glu	Ala	
				65					70			75		80	

Gly	Ala	Ile	Leu	Ala	Pro	Ala	Thr	His	Ala	Cys	Arg	Ala	Asn	Gly	Gln
					85				90			95			

Tyr	Phe	Leu	Thr	Asn	Cys	Cys	Ala	Pro	Glu	Asp	Ile	Gly	Phe	Cys	Leu
					100				105			110			

Glu	Gly	Gly	Cys	Leu	Val	Ala	Leu	Gly	Cys	Thr	Val	Cys	Thr	Asp	Arg
				115				120			125				

Cys	Trp	Pro	Leu	Tyr	Gln	Ala	Gly	Leu	Ala	Val	Arg	Pro	Gly	Lys	Ser
					130				135			140			

Ala	Ala	Gln	Leu	Val	Gly	Glu	Leu	Gly	Ser	Leu	Tyr	Gly	Pro	Leu	Ser
				145				150			155		160		

Val	Ser	Ala	Tyr	Val	Ala	Gly	Ile	Leu	Gly	Leu	Gly	Glu	Val	Tyr	Ser
				165				170			175				

Gly Val Leu Thr Val Gly Val Ala Leu Arg Arg Arg Val Tyr Leu Met
180 185 190

Pro Asn Leu Lys Cys Ala Val Glu Cys Asp Val Lys Trp Gly Ser Glu
195 200 205

Phe Trp Arg Trp Thr Glu Gln Leu Ala Ser Asn Tyr Trp Ile Leu Glu
210 215 220

Tyr Leu Trp Lys Val Pro Phe Glu Phe Trp Arg Gly Val Met Ser Leu
225 230 235 240

Thr Pro Leu Leu Val Trp Val Ala Ala Leu Leu Leu Glu Gln Arg
245 250 255

Ile Val Met Val Phe Leu Leu Val Thr Met Ala Gly Met Leu Gln Gly
260 265 270

Ala Pro Ala Ser Val Leu Gly Ser Arg Pro Phe Asp Tyr Gly Leu Lys
275 280 285

Trp Gln Ser Cys Ser Cys Arg Ala Asn Gly Ser Arg Ile Pro Thr Gly
290 295 300

Glu Arg Val Trp Asp Arg Gly Asn Val Thr Leu Leu Cys Asp Cys Pro
305 310 315 320

Asn Gly Pro Trp Val Trp Val Pro Ala Phe Cys Gln Ala Val Gly Trp
325 330 335

Gly Asp Pro Ile Thr His Trp Ser His Gly Gln Asn Gln Trp Pro Leu
340 345 350

Ser Cys Pro Gln Tyr Val Tyr Gly Ser Val Ser Val Thr Cys Val Trp
355 360 365

Gly Ser Val Ser Trp Phe Ala Ser Thr Gly Gly Arg Asp Ser Lys Ile
370 375 380

Asp Val Trp Ser Leu Val Pro Val Gly Ser Ala Ser Cys Thr Ile Ala
385 390 395 400

Ala Leu Gly Ser Ser Asp Arg Asp Thr Val Val Glu Leu Ser Glu Trp
405 410 415

Gly Val Pro Cys Val Thr Cys Ile Leu Asp Arg Arg Pro Ala Ser Cys
420 425 430

Gly Thr Cys Val Arg Asp Cys Trp Pro Glu Thr Gly Ser Val Arg Phe
435 440 445

Pro Phe His Arg Cys Gly Thr Gly Pro Arg Leu Thr Lys Asp Leu Glu
450 455 460

Ala Val Pro Phe Val Asn Arg Thr Thr Pro Phe Thr Ile Arg Gly Pro
465 470 475 480

Leu Gly Asn Gln Gly Arg Gly Asn Pro Val Arg Ser Pro Leu Gly Phe
 485 490 495
 Gly Ser Tyr Thr Met Thr Lys Ile Arg Asp Ser Leu His Leu Val Lys
 500 505 510
 Cys Pro Thr Pro Ala Ile Glu Pro Pro Thr Gly Thr Phe Gly Phe Phe
 515 520 525
 Pro Gly Val Pro Pro Ile Asn Asn Cys Met Pro Leu Gly Thr Glu Val
 530 535 540
 Ser Glu Ala Leu Gly Gly Ala Gly Leu Thr Gly Gly Phe Tyr Glu Pro
 545 550 555 560
 Leu Val Arg Arg Cys Ser Glu Leu Met Gly Arg Arg Asn Pro Val Cys
 565 570 575
 Pro Gly Tyr Ala Trp Leu Ser Ser Gly Arg Pro Asp Gly Phe Ile His
 580 585 590
 Val Gln Gly His Leu Gln Glu Val Asp Ala Gly Asn Phe Ile Pro Pro
 595 600 605
 Pro Arg Trp Leu Leu Leu Asp Phe Val Phe Val Leu Leu Tyr Leu Met
 610 615 620
 Lys Leu Ala Glu Ala Arg Leu Val Pro Leu Ile Leu Leu Leu Leu Trp
 625 630 635 640
 Trp Trp Val Asn Gln Leu Ala Val Leu Gly Leu Pro Ala Val Asp Ala
 645 650 655
 Ala Val Ala Gly Glu Val Phe Ala Gly Pro Ala Leu Ser Trp Cys Leu
 660 665 670
 Gly Leu Pro Thr Val Ser Met Ile Leu Gly Leu Ala Asn Leu Val Leu
 675 680 685
 Tyr Phe Arg Trp Met Gly Pro Gln Arg Leu Met Phe Leu Val Leu Trp
 690 695 700
 Lys Leu Ala Arg Gly Ala Phe Pro Leu Ala Leu Leu Met Gly Ile Ser
 705 710 715 720
 Ala Thr Arg Gly Arg Thr Ser Val Leu Gly Ala Glu Phe Cys Phe Asp
 725 730 735
 Val Thr Phe Glu Val Asp Thr Ser Val Leu Gly Trp Val Val Ala Ser
 740 745 750
 Val Val Ala Trp Ala Ile Ala Leu Leu Ser Ser Met Ser Ala Gly Gly
 755 760 765
 Trp Lys His Lys Ala Val Ile Tyr Arg Thr Trp Cys Lys Gly Tyr Gln
 770 775 780

Ala Val Arg Gln Arg Val Val Arg Ser Pro Leu Gly Glu Gly Arg Pro
 785 790 795 800
 Thr Lys Leu Leu Thr Phe Ala Trp Cys Leu Ala Ser Tyr Ile Trp Pro
 805 810 815
 Asp Ala Val Met Met Val Val Ala Leu Val Leu Leu Phe Gly Leu
 820 825 830
 Phe Asp Ala Leu Asp Trp Ala Leu Glu Glu Leu Leu Val Ser Arg Pro
 835 840 845
 Ser Leu Arg Arg Leu Ala Arg Val Val Glu Cys Cys Val Met Ala Gly
 850 855 860
 Glu Lys Ala Thr Thr Ile Arg Leu Val Ser Lys Met Cys Ala Arg Gly
 865 870 875 880
 Ala Tyr Leu Phe Asp His Met Gly Ser Phe Ser Arg Ala Val Lys Glu
 885 890 895
 Arg Leu Leu Glu Trp Asp Ala Ala Leu Glu Pro Leu Ser Phe Thr Arg
 900 905 910
 Thr Asp Cys Arg Ile Ile Arg Asp Ala Ala Arg Thr Leu Ser Cys Gly
 915 920 925
 Gln Cys Val Met Gly Leu Pro Val Val Ala Arg Arg Gly Asp Glu Val
 930 935 940
 Leu Ile Gly Val Phe Gln Asp Val Asn His Leu Pro Pro Gly Phe Val
 945 950 955 960
 Pro Thr Ala Pro Val Val Ile Arg Arg Cys Gly Lys Gly Phe Leu Gly
 965 970 975
 Val Thr Lys Ala Ala Leu Thr Gly Arg Asp Pro Asp Leu His Pro Gly
 980 985 990
 Asn Val Met Val Leu Gly Thr Ala Thr Ser Arg Ser Met Gly Thr Cys
 995 1000 1005
 Leu Asn Gly Leu Leu Phe Thr Thr Phe His Gly Ala Ser Ser Arg Thr
 1010 1015 1020
 Ile Ala Thr Pro Val Gly Ala Leu Asn Pro Arg Trp Trp Ser Ala Ser
 1025 1030 1035 1040
 Asp Asp Val Thr Val Tyr Pro Leu Pro Asp Gly Ala Thr Ser Leu Thr
 1045 1050 1055
 Pro Cys Thr Cys Gln Ala Glu Ser Cys Trp Val Ile Arg Ser Asp Gly
 1060 1065 1070
 Ala Leu Cys His Gly Leu Ser Lys Gly Asp Lys Val Glu Leu Asp Val
 1075 1080 1085

Ala Met Glu Val Ser Asp Phe Arg Gly Ser Ser Gly Ser Pro Val Leu
1090 1095 1100

Cys Asp Lys Gly His Ala Val Arg Met Leu Val Ser Val Leu His Ser
1105 1110 1115 1120

Gly Gly Arg Val Thr Ala Ala Arg Phe Thr Arg Pro Trp Thr Gln Val
1125 1130 1135

Pro Thr Asp Ala Lys Thr Thr Glu Pro Pro Pro Val Pro Ala Lys
1140 1145 1150

Gly Val Phe Lys Glu Ala Pro Leu Phe Met Pro Thr Gly Ala Gly Lys
1155 1160 1165

Ser Thr Arg Val Pro Leu Glu Tyr Gly Asn Met Gly His Lys Val Leu
1170 1175 1180

Ile Leu Asn Pro Ser Val Ala Thr Val Arg Ala Met Gly Pro Tyr Met
1185 1190 1195 1200

Glu Arg Leu Ala Gly Lys His Pro Ser Ile Tyr Cys Gly His Asp Thr
1205 1210 1215

Thr Ala Phe Thr Arg Ile Thr Asp Ser Pro Leu Thr Tyr Ser Thr Tyr
1220 1225 1230

Gly Arg Phe Leu Ala Asn Pro Arg Gln Met Leu Arg Gly Val Ser Val
1235 1240 1245

Val Ile Cys Asp Glu Cys His Ser His Asp Ser Thr Val Leu Leu Gly
1250 1255 1260

Ile Gly Arg Val Arg Glu Leu Ala Arg Gly Cys Gly Val Gln Leu Val
1265 1270 1275 1280

Leu Tyr Ala Thr Ala Thr Pro Pro Gly Ser Pro Met Thr Gln His Pro
1285 1290 1295

Ser Ile Ile Glu Thr Lys Leu Asp Val Gly Glu Ile Pro Phe Tyr Gly
1300 1305 1310

His Gly Ile Pro Leu Glu Arg Met Arg Thr Gly Arg His Leu Val Phe
1315 1320 1325

Cys His Ser Lys Ala Glu Cys Glu Arg Leu Ala Gly Gln Phe Ser Ala
1330 1335 1340

Arg Gly Val Asn Ala Ile Ala Tyr Tyr Arg Gly Lys Asp Ser Ser Ile
1345 1350 1355 1360

Ile Lys Asp Gly Asp Leu Val Val Cys Ala Thr Asp Ala Leu Ser Thr
1365 1370 1375

Gly Tyr Thr Gly Asn Phe Asp Ser Val Thr Asp Cys Gly Leu Val Val
1380 1385 1390

Glu Glu Val Val Glu Val Thr Leu Asp Pro Thr Ile Thr Ile Ser Leu
 1395 1400 1405
 Arg Thr Val Pro Ala Ser Ala Glu Leu Ser Met Gln Arg Arg Gly Arg
 1410 1415 1420
 Thr Gly Arg Gly Arg Ser Gly Arg Tyr Tyr Ala Gly Val Gly Lys
 1425 1430 1435 1440
 Ala Pro Ala Gly Val Val Arg Ser Gly Pro Val Trp Ser Ala Val Glu
 1445 1450 1455
 Ala Gly Val Thr Trp Tyr Gly Met Glu Pro Asp Leu Thr Ala Asn Leu
 1460 1465 1470
 Leu Arg Leu Tyr Asp Asn Cys Pro Tyr Thr Ala Ala Val Ala Ala Asp
 1475 1480 1485
 Ile Gly Glu Ala Ala Val Phe Phe Ser Gly Leu Ala Pro Leu Arg Met
 1490 1495 1500
 His Pro Asp Val Ser Trp Ala Lys Val Arg Gly Val Asn Trp Pro Phe
 1505 1510 1515 1520
 Leu Val Gly Val Gln Arg Thr Met Cys Arg Glu Thr Leu Ser Pro Gly
 1525 1530 1535
 Pro Ser Asp Asp Pro Gln Trp Ala Gly Leu Lys Gly Pro Asn Pro Val
 1540 1545 1550
 Pro Leu Leu Leu Arg Trp Gly Asn Asp Leu Pro Ser Lys Val Ala Gly
 1555 1560 1565
 His His Ile Val Asp Asp Leu Val Arg Arg Leu Gly Val Ala Glu Gly
 1570 1575 1580
 Tyr Val Arg Cys Asp Ala Gly Pro Ile Leu Met Val Gly Leu Ala Ile
 1585 1590 1595 1600
 Ala Gly Gly Met Ile Tyr Ala Ser Tyr Thr Gly Ser Leu Val Val Val
 1605 1610 1615
 Thr Asp Trp Asp Val Lys Gly Gly Ser Pro Leu Tyr Arg His Gly
 1620 1625 1630
 Asp Gln Ala Thr Pro Gln Pro Val Val Gln Val Pro Pro Val Asp His
 1635 1640 1645
 Arg Pro Gly Gly Glu Ser Ala Pro Ser Asp Ala Asn Thr Val Thr Asp
 1650 1655 1660
 Ala Val Ala Ala Ile Gln Val Asp Cys Asp Trp Ser Val Met Thr Leu
 1665 1670 1675 1680
 Ser Ile Gly Glu Val Leu Ser Leu Ala Gln Ala Lys Thr Ala Glu Ala
 1685 1690 1695

Tyr Ala Ala Thr Thr Lys Trp Leu Ala Gly Cys Tyr Thr Gly Thr Arg
1700 1705 1710

Ala Val Pro Thr Val Ser Ile Val Asp Lys Leu Phe Ala Gly Gly Trp
1715 1720 1725

Ala Ala Val Val Gly His Cys His Ser Val Ile Ala Ala Ala Val Ala
1730 1735 1740

Ala Tyr Gly Ala Ser Arg Ser Pro Pro Leu Ala Ala Ala Ala Ser Tyr
1745 1750 1755 1760

Leu Met Gly Leu Gly Val Gly Gly Asn Ala Gln Thr Arg Leu Ala Ser
1765 1770 1775

Ala Leu Leu Leu Gly Ala Ala Gly Thr Ala Leu Gly Thr Pro Val Val
1780 1785 1790

Gly Leu Thr Met Ala Gly Ala Phe Met Gly Ser Ala Ser Val Ser Pro
1795 1800 1805

Ser Leu Val Thr Ile Leu Leu Gly Ala Val Gly Gly Trp Glu Gly Val
1810 1815 1820

Val Asn Ala Ala Ser Leu Val Phe Asp Phe Met Ala Gly Lys Leu Ser
1825 1830 1835 1840

Ser Glu Asp Leu Trp Tyr Ala Ile Pro Val Leu Thr Ser Pro Gly Ala
1845 1850 1855

Gly Leu Ala Gly Ile Ala Leu Gly Leu Val Leu Tyr Ser Ala Asn Asn
1860 1865 1870

Ser Gly Thr Thr Trp Leu Asn Arg Leu Leu Thr Thr Leu Pro Arg
1875 1880 1885

Ser Ser Cys Ile Pro Asp Ser Tyr Phe Gln Gln Ala Asp Tyr Cys Asp
1890 1895 1900

Lys Val Ser Ala Val Leu Arg Arg Leu Ser Leu Thr Arg Thr Val Val
1905 1910 1915 1920

Ala Leu Val Asn Arg Glu Pro Lys Val Asp Glu Val Gln Val Gly Tyr
1925 1930 1935

Val Trp Asp Leu Trp Glu Trp Ile Met Arg Gln Val Arg Met Val Met
1940 1945 1950

Ala Arg Leu Arg Ala Leu Cys Pro Val Val Ser Leu Pro Leu Trp His
1955 1960 1965

Cys Gly Glu Gly Trp Ser Gly Glu Trp Leu Leu Asp Gly His Val Glu
1970 1975 1980

Ser Arg Cys Leu Cys Gly Cys Val Ile Thr Gly Asp Val Leu Asn Gly
1985 1990 1995 2000

Gln Leu Lys Asp Pro Val Tyr Ser Thr Lys Leu Cys Arg His Tyr Trp
 2005 2010 2015
 Met Gly Thr Val Pro Val Asn Met Leu Gly Tyr Gly Glu Thr Ser Pro
 2020 2025 2030
 Leu Leu Ala Ser Asp Thr Pro Lys Val Val Pro Phe Gly Thr Ser Gly
 2035 2040 2045
 Trp Ala Glu Val Val Val Thr Pro Thr His Val Val Ile Arg Arg Thr
 2050 2055 2060
 Ser Ala Tyr Lys Leu Leu Arg Gln Gln Ile Leu Ser Ala Ala Val Ala
 2065 2070 2075 2080
 Glu Pro Tyr Tyr Val Asp Gly Ile Pro Val Ser Trp Asp Ala Asp Ala
 2085 2090 2095
 Arg Ala Pro Ala Met Val Tyr Gly Pro Gly Gln Ser Val Thr Ile Asp
 2100 2105 2110
 Gly Glu Arg Tyr Thr Leu Pro His Gln Leu Arg Leu Arg Asn Val Ala
 2115 2120 2125
 Pro Ser Glu Val Ser Ser Glu Val Ser Ile Asp Ile Gly Thr Glu Thr
 2130 2135 2140
 Glu Asp Ser Glu Leu Thr Glu Ala Asp Leu Pro Pro Ala Ala Ala
 2145 2150 2155 2160
 Leu Gln Ala Ile Glu Asn Ala Ala Arg Ile Leu Glu Pro His Ile Asp
 2165 2170 2175
 Val Ile Met Glu Asp Cys Ser Thr Pro Ser Leu Cys Gly Ser Ser Arg
 2180 2185 2190
 Glu Met Pro Val Trp Gly Glu Asp Ile Pro Arg Thr Pro Ser Pro Ala
 2195 2200 2205
 Leu Ile Ser Val Thr Glu Ser Ser Pro Asp Glu Lys Thr Pro Ser Val
 2210 2215 2220
 Ser Ser Ser Gln Glu Asp Thr Pro Ser Ser Asp Ser Phe Glu Val Ile
 2225 2230 2235 2240
 Gln Glu Ser Glu Thr Ala Glu Gly Glu Glu Ser Val Phe Asn Val Ala
 2245 2250 2255
 Leu Ser Val Leu Lys Ala Leu Phe Pro Gln Ser Asp Ala Thr Arg Lys
 2260 2265 2270
 Leu Thr Val Lys Met Ser Cys Cys Val Glu Lys Ser Val Thr Arg Phe
 2275 2280 2285
 Phe Ser Leu Gly Leu Thr Val Ala Asp Val Ala Ser Leu Cys Glu Met
 2290 2295 2300

Glu Ile Gln Asn His Thr Ala Tyr Cys Asp Lys Val Arg Thr Pro Leu
2305 2310 2315 2320

Glu Leu Gln Val Gly Cys Leu Val Gly Asn Glu Leu Thr Phe Glu Cys
2325 2330 2335

Asp Lys Cys Glu Ala Arg Gln Glu Thr Leu Ala Ser Phe Ser Tyr Ile
2340 2345 2350

Trp Ser Gly Val Pro Leu Thr Arg Ala Thr Pro Ala Lys Pro Pro Val
2355 2360 2365

Val Arg Pro Val Gly Ser Leu Leu Val Ala Asp Thr Thr Lys Val Tyr
2370 2375 2380

Val Thr Asn Pro Asp Asn Val Gly Arg Arg Val Asp Lys Val Thr Phe
2385 2390 2395 2400

Trp Arg Ala Pro Arg Val His Asp Lys Phe Leu Val Asp Ser Ile Glu
2405 2410 2415

Arg Ala Lys Arg Ala Ala Gln Ala Cys Leu Ser Met Gly Tyr Thr Tyr
2420 2425 2430

Glu Glu Ala Ile Arg Thr Val Arg Pro His Ala Ala Met Gly Trp Gly
2435 2440 2445

Ser Lys Val Ser Val Lys Asp Leu Ala Thr Pro Ala Gly Lys Met Ala
2450 2455 2460

Val His Asp Arg Leu Gln Glu Ile Leu Glu Gly Thr Pro Val Pro Phe
2465 2470 2475 2480

Thr Leu Thr Val Lys Lys Glu Val Phe Phe Lys Asp Arg Lys Glu Glu
2485 2490 2495

Lys Ala Pro Arg Leu Ile Val Phe Pro Pro Leu Asp Phe Arg Ile Ala
2500 2505 2510

Glu Lys Leu Ile Leu Gly Asp Pro Gly Arg Val Ala Lys Ala Val Leu
2515 2520 2525

Gly Gly Ala Tyr Ala Phe Gln Tyr Thr Pro Asn Gln Arg Ile Arg Glu
2530 2535 2540

Met Leu Lys Leu Trp Glu Ser Lys Lys Thr Pro Cys Ala Ile Cys Val
2545 2550 2555 2560

Asp Ala Thr Cys Phe Asp Ser Ser Ile Thr Glu Glu Asp Val Ala Leu
2565 2570 2575

Glu Thr Glu Leu Tyr Ala Leu Ala Ser Asp His Pro Glu Trp Val Arg
2580 2585 2590

Ala Leu Gly Lys Tyr Tyr Ala Ser Gly Thr Met Val Thr Pro Glu Gly
2595 2600 2605

Val Pro Val Gly Glu Arg Tyr Cys Arg Ser Ser Gly Val Leu Thr Thr
2610 2615 2620

Ser Ala Ser Asn Cys Leu Thr Cys Tyr Ile Lys Val Lys Ala Ala Cys
2625 2630 2635 2640

Glu Arg Val Gly Leu Lys Asn Val Ser Leu Leu Ile Ala Gly Asp Asp
2645 2650 2655

Cys Leu Ile Ile Cys Glu Arg Pro Val Cys Asp Pro Ser Asp Ala Leu
2660 2665 2670

Gly Arg Ala Leu Ala Ser Tyr Gly Tyr Ala Cys Glu Pro Ser Tyr His
2675 2680 2685

Ala Ser Leu Asp Thr Ala Pro Phe Cys Ser Thr Trp Leu Ala Glu Cys
2690 2695 2700

Asn Ala Asp Gly Lys Arg His Phe Phe Leu Thr Thr Asp Phe Arg Arg
2705 2710 2715 2720

Pro Leu Ala Arg Met Ser Ser Glu Tyr Ser Asp Pro Met Ala Ser Ala
2725 2730 2735

Ile Gly Tyr Ile Leu Leu Tyr Pro Trp His Pro Ile Thr Arg Trp Val
2740 2745 2750

Ile Ile Pro His Val Leu Thr Cys Ala Phe Arg Gly Gly Thr Pro
2755 2760 2765

Ser Asp Pro Val Trp Cys Gln Val His Gly Asn Tyr Tyr Lys Phe Pro
2770 2775 2780

Leu Asp Lys Leu Pro Asn Ile Ile Val Ala Leu His Gly Pro Ala Ala
2785 2790 2795 2800

Leu Arg Val Thr Ala Asp Thr Thr Lys Thr Lys Met Glu Ala Gly Lys
2805 2810 2815

Val Leu Ser Asp Leu Lys Leu Pro Gly Leu Ala Val His Arg Lys Lys
2820 2825 2830

Ala Gly Ala Leu Arg Thr Arg Met Leu Arg Ser Arg Gly Trp Ala Glu
2835 2840 2845

Leu Ala Arg Gly Leu Leu Trp Arg Pro Gly Leu Arg Leu Pro Pro Pro
2850 2855 2860

Glu Ile Ala Gly Ile Pro Gly Gly Phe Pro Leu Ser Pro Pro Tyr Met
2865 2870 2875 2880

Gly Val Val His Gln Leu Asp Phe Thr Ser Gln Arg Ser Arg Trp Arg
2885 2890 2895

Trp Leu Gly Phe Leu Ala Leu Leu Ile Val Ala Leu Phe Gly
2900 2905 2910

